

Naval War College
Newport, R.I.

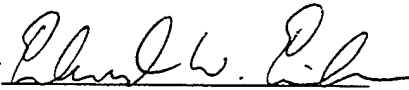
BREAKING THROUGH THE WALL: A REALISTIC PERSPECTIVE OF THE VERY
SHALLOW WATER (VSW) AND SURF ZONE (SZ) MINE THREAT.

By

Edward W. Eidson
LCDR, USN

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the
requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily
endorsed by the Naval War College or the Department of the Navy.

Signature: 

08 February 2000

Faculty Advisor: CAPT Robert E. McCabe III

20000621 117

DMC QUALITY INSPECTED 4

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority: N/A			
3. Declassification/Downgrading Schedule: N/A			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title (Include Security Classification): BREAKING THROUGH THE WALL: A REALISTIC PERSPECTIVE OF THE VERY SHALLOW WATER (VSW) AND SURF ZONE (SZ) MINE THREAT. (U)			
9. Personal Authors: Edward W. Eidson, LCDR, USN			
10. Type of Report: FINAL		11. Date of Report: 08 February 2000	
12. Page Count: 29		Advisor: CAPT R.E. McCabe III	
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: Mine, Warfare, Countermeasures, Very Shallow Water, VSW, Surf Zone, SZ, Explosive Ordnance Disposal, EOD, Amphibious			
<p>15. Abstract: The ability to project power ashore through amphibious operations is a Navy and Marine Corps core competency that must be maintained in order to allow global response as delineated in the National Security Strategy. Because of the VSW/SZ mine threat, the technological inability to defeat it, amphibious doctrinal rigidity, and "zero acceptable casualties" mentality, the United States has become incapable of projecting power ashore. This limits the available options to the Operational Commander and neutralizes the advantages of strategic and operational mobility inherent in Naval forces.</p> <p>The proliferation and technological simplicity of mines has made VSW/SZ mining an economic flexible deterrent option, against amphibious assault, for third world nations incapable of challenging the United States conventionally. This, coupled with the inability to technologically defeat the threat, necessitates a means of threat mitigation and a flexible approach if the United States intends to maintain the ability to conduct opposed amphibious operations. This impediment has resulted from the rigidity of amphibious doctrine and an aversion to casualties constraining the Operational Commander and relinquishing the initiative to potential adversaries.</p> <p>Technological advances in mine detection and over-the-horizon amphibious vehicles, doctrinal flexibility, and planning at the appropriate level, when coupled with the tenants of Operational Maneuver from the Sea, will provide a means of mitigating the threat to an acceptable level.</p>			
16. Distribution / Availability of Abstract: Unlim	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

Abstract of

BREAKING THROUGH THE WALL: A REALISTIC PERSPECTIVE OF THE VERY
SHALLOW WATER (VSW) AND SURF ZONE (SZ) MINE THREAT.

The ability to project power ashore through amphibious operations is a Navy and Marine Corps core competency that must be maintained in order to allow global response as delineated in the National Security Strategy. Because of the VSW/SZ mine threat, the technological inability to defeat it, amphibious doctrinal rigidity, and “zero acceptable casualties” mentality, the United States has become incapable of projecting power ashore. This limits the available options to the Operational Commander and neutralizes the advantages of strategic and operational mobility and maneuver inherent in Naval forces.

The proliferation and technological simplicity of mines has made VSW/SZ mining an economic flexible deterrent option, against amphibious assault, for third world nations incapable of challenging the United States conventionally. This, coupled with the inability to technologically defeat the threat, necessitates a means of threat mitigation and a flexible approach if the United States intends to maintain the ability to conduct opposed amphibious operations. This impediment has resulted from the rigidity of amphibious doctrine and an aversion to casualties constraining the Operational Commander and relinquishing the operational initiative to potential adversaries.

Technological advances in mine detection and over-the-horizon amphibious assault vehicles, doctrinal flexibility, and planning at the appropriate level, when coupled with the tenants of Operational maneuver from the Sea, will provide a means of mitigating the threat to an acceptable level.

Table of Contents

<u>Section</u>	<u>Page</u>
1. Title Page	i
2. Abstract	ii
3. Table of Contents	iii
4. Introduction	1
5. Historical Threat	4
6. Present Day Threat	4
7. Current Efforts/Initiatives	6
8. Evaluating the Threat	7
9. Doctrinal Perspective	8
10. Going Around the Wall	10
11. Going Over the Wall	11
12. Going Through the Wall	13
13. Conclusion	16
14. Recommendations	18
15. Endnotes	19
16. Bibliography	21
17. Appendix A: VSW/SZ Minefield Disruption Considerations	23
18. Appendix B, Figure (1)	25
19. Appendix B, Figure (2)	26

1. Introduction

In the post cold war era, the United States has emerged as the only maritime superpower. This status, coupled with our ideology, encompasses the responsibility to police the freedom of the seas and deter aggression that jeopardizes world harmony. In order to accomplish this, joint doctrine requires the ability for United States Naval forces to project power ashore from the sea through amphibious operations to include an opposed landing at the water's edge, if required.¹ Because of the Very Shallow Water (VSW) and Surf Zone (SZ) mine threat, the United States has become incapable of projecting power ashore limiting the available options to the Operational Commander and neutralizing the advantages of strategic and operational mobility and maneuver inherent in Naval forces.

The National Security Strategy delineates power projection as a critical strategic capability to protect the national interests of the United States.² The National Military Strategy dictates the requirement to maintain the ability to project power ashore through amphibious operations.³ Joint Doctrine depicts the amphibious operations as a Navy and Marine Corps core competency and Joint Tactics, Techniques, and Procedures (JTTP) are restrictive to Naval force employment.⁴ Additionally, military planners have been forced to place an unrealistic emphasis on the risk of casualties in planning considerations to the extent of adopting a "zero casualties" mentality when evaluating the options for potential Courses of Action (COAs). This mentality, coupled with the doctrinal constraint of exclusively naval force employment for amphibious operations, has limited the available planning options for Operational Commander. The primary impediment, to an acceptable casualty risk assessment, is the inability to technologically defeat the Very Shallow Water (VSW) and Surf Zone (SZ) mine threat. Joint force employment provides the

Operational Commander the ability to mitigate the VSW/SZ mine threat by approaching the problem from a perspective of incremental threat reduction that employs the inherent strengths of various units applied to specific situations to gain the greatest possible advantage.

During the planning process, the delegation of amphibious operations planning to the Amphibious Readiness Group (ARG) Commander, and the doctrinal implication of exclusively Naval force employment, produces an unnecessary constraint on alternate means of reducing the threat and establishing combat power ashore. With our inability to technologically defeat the VSW/SZ mine threat, this method relies on the inherent mobility and maneuver Naval forces provides to defeat the VSW/SZ mine threat by avoidance. Although achievable in many circumstances, the situation where maneuver cannot be employed because of the geographic significance of a specific location or a limitation on the available sites suitable for amphibious operations will undoubtedly arise. When these instances occur, this doctrinal approach forces the planners to traverse a VSW/SZ minefield, by sea-borne conveyance, through breaching by force. Breaching by force, without alternative means for threat mitigation, will produce an unacceptable COA due to the risk of casualties.

During the Gulf War, the VSW/SZ mine threat prevented an amphibious assault because of the aforementioned considerations.⁵ In the case of the Gulf War, the military objectives were achievable through alternate means and the necessity to adopt an amphibious operation as a COA was avoided. The ability to forego the amphibious assault in future operations cannot be assumed. When the protection of national interests becomes critical, the importance of casualty avoidance will diminish. Additionally, with

the realistic shift in emphasis to the littoral arena, a COA that employs amphibious operations may become the only viable means of accomplishing military objectives. When this occurs, the planners must have the ability to doctrinally consider every available option for threat mitigation to prevent unnecessary casualties and improve the feasibility and acceptability of amphibious operations as a means of establishing combat power ashore.

Current doctrine does not provide the flexibility required to effectively address the VSW/SZ mine threat. Doctrinal publications that address amphibious operations are up to ten years old since last revision and more recently revised publications draw from documents that do not inherently consider joint force employment in amphibious operations. Additionally, because planning for amphibious operations is conducted at the ARG level, joint forces that could be employed to specific situations are not initially considered because they are outside the organic amphibious forces and would have to be requested from higher authority. The Joint Task Force (JTF) or Commander in Chief (CINC) level provides access to joint forces that could be employed to achieve incremental threat reduction when employed for specific actions in the overall scheme of maneuver.

The doctrinal publications that govern amphibious operations have not been revised to reflect the VSW/SZ mine threat proliferation and our current technological and tactical inability to defeat the threat. This paper will focus on the causes of this doctrinal limitation in today's world environment and the reasons the approach to amphibious operations planning must be modified to effectively and realistically address the current threat. Additionally, broad advantages and disadvantages to alternate COAs will be

addressed from the Operational Commander's perspective when conducted with a joint force approach to VSW/SZ mine threat reduction.

In addition to the publications delineated in the bibliography, this paper relies heavily on the author's experience as an Explosive Ordnance Disposal Officer and Officer in Charge of a Mine Countermeasures detachment operating in the Pacific theater of operations.

2. Historical Threat

The threat of mines in the VSW/SZ arenas has not appreciably changed in the last fifty years. In the past, mine countermeasures (MCM) to effectively defeat the VSW/SZ mine threat did not exist. Detection through beach reconnaissance was the emphasis for the Underwater Demolition Teams (UDT). Once mines were detected, an alternate beach for the amphibious assault was selected thereby avoiding the problem and ignoring the fact that current technology and tactics did not provide a viable means to defeat the threat once present. Additionally, the availability of mines was restricted to few nations and doctrinal methods of employment had not been established. Therefore, the need to develop effective technology and tactics to defeat the threat was not a priority.

Following the Korean conflict, the lessons derived from the landings at Wonson were not applied towards technological developments, tactical deficiencies, or force structure considerations.⁶ During the Gulf War, when the first large-scale opposed amphibious assault was contemplated since the Korean conflict, this shortcoming in Navy capabilities became painfully obvious and the fear of VSW/SZ mines prevented the execution of a planned amphibious assault into Iraq or Kuwait.⁷

3. Present Day Threat

Today, the threat has not appreciably changed. However, mine availability and comparatively low cost has caused a worldwide proliferation of mines and increased their potential use as a flexible deterrent option (FDO) for third world countries.⁸ With the United States shift in emphasis to littoral warfare, this option may be the only means for a third world nation, incapable of opposing the United States either conventionally or at sea, to deter against an invasion. Additionally, the relatively low technological sophistication, enhanced by the inability to counter the threat, has made mine warfare the method of choice for most third world nations, increasing the number of producers and further adding to mine proliferation

The advantage of Operational Maneuver from the Sea (OMFTS) that naval forces provide, results from the ability to maintain the exact location of the proposed landing site undisclosed until the last possible moment. When successfully accomplished, the enemy must either guard all of the possible landing sites on the respective coast to conduct a defense at the water's edge, or mass his forces in a central location and respond to the amphibious assault by maneuver, conducting a defense in depth.⁹ In the latter method, a defense at the water's edge is highly improbable as the assaulting force will be able to mass sufficient power ashore prior to contact with the opposing force to render a defense at the water's edge impossible. The advantage gained, by achieving the element of surprise, is realized by gaining and maintaining offensive operational momentum through seamless continuity of operations. In order for this to be successful, assaulting a position of enemy weakness and then successively reinforcing to a combat level capable of holding a beachhead, until sufficient combat power is ashore, to transition to offensive operations, is a requirement. When properly executed, the operational tempo and momentum denies the enemy the opportunity to maneuver his forces to effectively defeat the assault.¹⁰ Any interruption of this continuity of operations will slow the tempo of

the assault, providing the defending force with the operational pause required to maneuver his forces, thereby diminishing the advantage gained by OMFTS. VSW and SZ mines present a situation where the enemy can cause this operational pause in the assault. In order to ensure the successful application of OMFTS, MCM operations must be conducted clandestinely, to conceal the location of the intended landing, or in stream (as the assault waves approach the beach) with the amphibious assault, to prevent cessation of the assault until clearance can be completed. With current doctrinal requirements to conduct MCM operations prior to the amphibious assault, a clandestine MCM effort is dictated. The ability to perform this operation clandestinely prior to the amphibious assault exceeds available technological capabilities.

4. Current Efforts/Initiatives

Current technological advances, in VSW and SZ minefield neutralization, have produced less than acceptable results. However, developments in detection have been increasingly successful. The development of the MK 8 mammal systems, Airborne Laser Mine Detection System (ALMDS), and the AN/AQS-20X Sonar Mine Detection Set have produced promising results when matched to specific environmental and bottom conditions, that selectively employ the advantages of a specific, or combination of systems, to detecting the threat.¹¹ These technological developments, augmented with human capabilities when required and critically employed to each situation, will produce a reliable detection capability for the Operational Commander.

Short-term initiatives in clearance and neutralization techniques have produced no successful method, clandestinely or in stream, of defeating a VSW/SZ minefield.¹² Developments such as the Mine Countermeasures Landing Craft Air Cushion (MCAC), remotely operated vehicles with a fiber optics control cable, and the Anti-sag plowing system

all have limitations that do not achieve the required effectiveness to mitigate the threat to an acceptable level in the VSW/SZ arena.¹³

Technological advances in the area of detection and near term initiatives coupled with intelligence, surveillance, and reconnaissance could prove effective in determining the presence or absence of a VSW/SZ mine threat in the near term. Since this capability is within reach, the question must be asked if a method of clearance or neutralization can be developed that would effectively defeat the threat.

After six years of research and development by the VSW MCM Detachment and the Marine Corps Combat Development Command (MCCDC), and given the current relatively simple state of technology of VSW/SZ mines, no method has been developed that can effectively defeat a VSW/SZ minefield. The tenants of OMFTS dictate a clandestine method of minefield clearance or neutralization. Realistically, this requirement cannot be accomplished reliably for the considerations outlined in Appendix (a).

Given these limitations, it will require a monumentous effort and considerable expense to develop a viable means to neutralize or clear a VSW/SZ minefield. Additionally, assuming a method could be developed that proved successful, an infinitesimal advance in mine technology or a countermeasure can be implemented in the mine itself that would require an extremely disproportionate technological advance to make clearance again feasible. This technological move and countermove is a game that would most probably never be won and the resources required to achieve it, even if feasible, would be preclusive.¹⁴

5. Evaluating the Threat

The actual threat posed by VSW/SZ mines is overrated in terms of its effect on the overall accomplishment of the objective. The actual size and explosive weight of the mines

predominantly employed in the VSW/SZ arena is relatively small compared to those employed in deep water mining. Additionally, the destructive power of underwater mines resides in the shock wave created by the propagation of the explosive wave and the bubble created by the explosion. Since VSW/SZ mines are employed in relatively shallow depths, the majority of the explosive force is vented in a plume releasing the destructive energy. Because the majority of assault craft are armored and their power plants relatively robust, the threat from the shock wave is significantly reduced.¹⁵

The primary threat VSW/SZ mines pose to the amphibious assault force is the disablement of a vessel that would cause a bottleneck in the approach lanes and subject either the disabled or bottle necked vessels to shore and air based fire as stationary targets.

This perspective is not intended to imply that there would be no personnel or equipment casualties. However, the number of casualties sustained during the assault would far exceed the number sustained by the effects of a VSW/SZ minefield.

6. Doctrinal Perspective

Current joint doctrine establishes amphibious operations and mine countermeasures as Marine Corps and Navy core competency capabilities.¹⁶ This implies that the responsibility for amphibious operations is delegated to the Amphibious Readiness Group (ARG) Commander, as the Commander Amphibious Task Force (CATF), and rests solely with the Naval forces. Because of this organizational structure, joint forces better suited and assigned to accomplish specific missions do not fall under the operational control (OPCON) of the CATF or Commander Landing Force (CLF). Therefore, joint force employment can only be accomplished by requesting additional support from higher authority. The employment of supporting forces not organic to the assigned forces is not frequently considered during the

initial COA feasibility and acceptability assessment. An amphibious operation could be deemed unfeasible or feasible but unacceptable due to the casualty statistics associated with a COA employing only assets organic to the ARG. Additionally, if the requirement to conduct an amphibious assault were unavoidable, the propensity to conduct the operation with the assigned forces would produce unnecessary casualties. If responsibility for a complex amphibious operations resided with a Joint Task Force (JTF) Commander, the employment of joint forces more suited to specific missions would be more easily and readily exercised. Furthermore, the seamless continuity of operations requisite for effective employment of OMFTS principles can be better coordinated, promulgated, and integrated, between joint forces when conducted at the JTF level. This will allow the commander's intent, alternative courses of action (COA), and associated decision points, to be understood and executed by assigned joint forces, independent of the amphibious operation, maintaining the overall joint scheme-of-maneuver.

On the operational level, MCM operations are viewed as a prerequisite to an assault from the sea thereby necessitating, as previously discussed, a clandestine VSW/SZ mine clearance operation. If doctrinal flexibility can be adapted to allow the clearance of the VSW/SZ minefields either in stream or integral to the amphibious assault, numerous options become available. Combined airborne and amphibious operations; Breach by Maneuver (BBM); Helicopter Insert, Breach Seaward (HIBS); Blast, Rake, Breach (BRB); and any other combination of force employment or potential clearing method become available options.

In short, the VSW/SZ mine threat has produced a wall that impedes the amphibious assault. When one is confronted by an obstacle such as a wall, common sense would dictate that one should not try to go through the wall. Rather, an attempt to go over the wall or around

the wall would be more prudent. If it is absolutely necessary to go through the wall, then the appropriate level of protection should be donned, the damage of the attempt anticipated, and a determination made as to whether or not it is worth going through it. The remaining question that this paper will attempt to address is why should we go around it, over it, and if required, through it and the associated complexity, advantages, and disadvantages these possible approaches present to the Operational Commander.

7. Going Around the Wall

OMFTS and the technological and doctrinal transition to over-the-horizon amphibious assault allow the Operational Commander the flexibility to conduct amphibious operations over a vast geographical area of an enemy coastline.¹⁷ Because of the vulnerability of VSW/SZ mines to displacement and burial by tidal forces and surface action, their effectiveness is transient and diminishes with time. Therefore, it is impossible, in most littoral areas, for VSW/SZ minefields to be placed permanently. Consequently, if an enemy intends to employ VSW/SZ mines as an FDO against an amphibious assault, the placement would have to occur after the anticipated landing areas have been assumed and as close to the time of the anticipated assault as possible. Additionally, the area would have to be maintained through mine replacement and repositioning, in order for it to remain effective. This allows the Operational Commander to employ intelligence and surveillance measures to determine the potential existence of a VSW/SZ minefield.

This method employs the basic tenants of OMFTS by making the best use of naval force mobility and mitigating the technological gap, in minefield neutralization capability, by avoiding the VSW/SZ mine threat. It capitalizes on the principles of surprise, mass, unity of

command, and simplicity. When this method can be employed, the risks to the amphibious assault force are minimal.

a. Advantages

- The technological requirement to develop effective breaching techniques is eliminated by avoiding the problem.
- If intelligence and surveillance assets detect the probable location of a VSW/SZ mine threat, deceptive operations can be employed to force the enemy into committing the defending force to an assumed assault location while concealing the actual assault.

b. Disadvantages

- The ability to select a number of potential landing sites could be restricted due to geography or bottom topography making the available landing sites predictable and therefore susceptible to mining with no available options for alternative landing site selection. This constraint would be further complicated by the fact that the enemy would also be able to mass forces against the amphibious landing and a defense at the water's edge would become imminent. In this particular situation, the costs of conducting an amphibious assault may outweigh the benefits for reasons other than the presence of VSW/SZ mines.
- Sea-borne displacement vehicles capable of Over-the-Horizon amphibious assault are not currently available in the fleet. Interim planning considerations will have to be employed to adopt COAs that remain within the current capabilities of amphibious forces.

8. Going Over the Wall

When mines are detected and alternate amphibious landing sites are not available, coordinating joint assets in a vertical envelopment, would be an available option to the

Operational Commander. In order to place a sizable force ashore in the least amount of time, a joint effort using air assault forces would provide the greatest maneuver advantage. A combined airborne and helicopter borne amphibious assault allows the rapid establishment of combat power ashore. After sufficient combat power is established ashore, maneuver to control alternate points for extraction or further reinforcement, such as airfields or ports, can be accomplished as part of the scheme of maneuver. Additionally, the air assault can be used to secure a portion of the shore to breach VSW/SZ minefields seaward in an overt manner. Many options become available for minefield clearance once the clandestine requirement has been removed. Precedence and doctrine for joint airborne amphibious operations has been established and the command and control structure is best assumed by the JTF commander for coordination, planning, and execution.¹⁸

The inherent risks associated with this option are the complexity of the operation and the inability to extract the forces if they are confronted with overwhelming resistance. Additionally, for a breach seaward operation, the air assault forces would be required to maintain a perimeter to allow overt seaward breaching of the VSW/SZ minefield. Because the location of the assault will be divulged upon committing the airborne forces, enemy resistance can be expected prior to completion of the amphibious landing. The time the assault forces can be expected to maintain a defensive perimeter is limited. Additionally, because airborne forces are light infantry, their defense against armor is extremely limited. However, the inherent speed and capability to rapidly place a sizable force ashore, and because the time required to breach seaward can be managed to coincide with the arrival of the first waves of the assault, the potential benefits of this option outweigh the costs of breaching through a VSW/SZ minefield by brute force. This method is applicable when no alternative beaching site can be

used to achieve the objective and an assault through a VSW/SZ minefield is required where enemy resistance is expected to be initially light, or there is no knowledge of the presence or absence of VSW/SZ mines and no time to get it.

a. Advantages

- The technological requirement to develop effective clandestine breaching techniques is eliminated by avoiding the problem.
- The inherent speed of which combat power can be established ashore diminishes the ability of the enemy to counter the assault.
- The flexibility of the airborne assault is in consonance with the tenants of Ship to Objective Maneuver (STOM) delineated in OMFTS.
- Navigation beacons are a prerequisite for boat lane navigation through breached minefields if any expectation of mine avoidance is anticipated. The air assault forces can establish the navigation beacons ashore to guide the amphibious assault waves, further reducing the hazards of a VSW/SZ threat.

b. Disadvantages

- If the assault forces meet with heavy enemy resistance prior to reinforcement, extraction could become impossible and the initial air assault forces would be sacrificed.
- If breaching of the minefields to further project power ashore is deemed necessary, seamless continuity of operations could be lost and an operational pause required while the assault forces held a beach perimeter and seaward breaching of the minefields conducted.
- Overt seaward breaching methods will have to be developed and tested for an acceptable level of minefield clearance confidence.

9. Going Through the Wall

When time, geography, or tactical significance dictate that an amphibious assault must be conducted through a VSW/SZ minefield, the ramifications of the decision have to be assessed on a cost verses benefit basis and not simply discounted because of the potential risk of sustaining casualties. If a specific landing site meets the above criteria necessitating the assault at a specific location, the prudent planner will assume the enemy has come to the same conclusion and the enemy will employ all available means to defend that area. In this case, the greatest risk does not rest with the VSW/SZ mines, but rather in the ability to, rapidly and audaciously, mass sufficient combat power ashore to defeat a defense at the water's edge. Conducting this type of assault violates the tenants of OMFTS. However, the potential need to conduct this type of operation exists and planning for casualty minimization through all available means must be employed as part of the planning process. Available technology and methods of force employment can be used to reduce the mine threat in the VSW/SZ arena. However, no method is currently available, nor will one probably ever be developed, that will ensure the complete defeat of the VSW/SZ mine threat.

In each case, where the need to go through the wall outweighs the potential risks, every method of reducing the risk should be employed to gain the greatest possible advantage. Research has shown that the most effective technique will likely be a combination of available methods that employ varying techniques and joint forces including joint national level assets.¹⁹ Each case will be different dependent on geography, bottom topography and composition, and proximity to tactically significant objectives, and will require different methods of employing assets to achieve the greatest reduction in threat. Therefore, doctrinal flexibility and force composition must be adapted to each operation. The deliberate planning process can provide

optimal force composition and tactical employment and delineate multiple COAs for the Operational Commander when conducted at the JTF level.

This option has been deemed feasible but unacceptable with the shift in mentality to “zero acceptable casualties” military operations. Amphibious operations have always been planned with a certain casualty statistic, for the assaulting forces, calculated into the overall plan. The same method must be employed in the planning process to account for equipment and personnel casualties that would occur as a result of landing through a VSW/SZ minefield.

The inherent risk associated with this option rests in its complexity and that an enemy defense at the water’s edge can be anticipated. Coordination and synchronization of all forces employed in the assault will be difficult for the planner. Employment of this method should only be contemplated when no other available option is feasible. However, to discount this option violates the National Military Strategy’s requirement to maintain freedom of the seas by maintaining the capability to project power ashore by conducting amphibious operations against an opposed landing.²⁰ Although conducting this operation would be costly, the risks, when coupled with a flexible approach to threat diminishment, are manageable and a successful landing achievable.

a. Advantages

- Initiative is not relinquished by allowing the geographical denial of a landing area.
- Continuity of operations can be maintained when properly coordinated.
- Psychological advantage over the enemy will be obtained by the demoralizing effect created by the audacity to successfully assault through their defenses.

b. Disadvantages

- Attacking at the enemy's strength violates the tenants of OMFTS and will produce significant casualties because of the loss of the element of surprise.
- Flexible doctrine must be developed that can be adapted to each specific operation dependent on the geography, terrain, bottom topography, and available forces.
- Complexity of the operation will require extensive detailed planning, coordination, and C2 capabilities.
- Equipment and personnel casualties must be assumed prior to reaching the beach and the associated scheme of maneuver to the objective must be flexible enough to allow individual units alternate COAs.
- Blue on Blue force engagement can be a major concern.

10. Conclusion

Simple mine technology is difficult to defeat when employed in the VSW/SZ arena. With the doctrinal shift delineated in "Forward From the Sea" and "Operational Maneuver from the Sea", rogue third world nations, incapable of conventional force defense, will more frequently choose coastal and VSW/SZ mining as a FDO against a potential amphibious operations. Therefore, mine proliferation and technological sophistication can be expected to increase in the future.

The near term achievable capability, that can effectively support OMFTS and capitalize on the inherent strength of United States Naval force's mobility and maneuver, is detection. Once detected, the tenants of OMFTS and the advantages of over-the- horizon amphibious assault can be employed to allow the forces to avoid the VSW/SZ threat. Research and development efforts should be directed towards achieving a reliable, inexpensive, organic, and clandestine detection method that can work throughout the full spectrum of VSW/SZ and

beach zone (BZ) littoral operating areas. After this has been achieved, development efforts should be directed towards systems that can be employed in concert with other available technologies to assist in diminishing the threat as opposed to eliminating the threat. Threat elimination is improbable and would result, as previously stated, in the technological move and counter move causing a cost preclusive race against inexpensive and incremental improvements in mine technology making a consummate solution impossible.

The delegation of the planning process to the Amphibious Task Force Command structure, coupled with the doctrinal implication of exclusively Naval force employment for amphibious operations, does not provide the avenues to effectively incorporate, direct, and control joint forces to mitigate the VSW/SZ mine threat. Current proposed naval doctrine has established a Mine Warfare Commander (MIWC) to control MCM assets. The MIWC in the proposed C2 organization is subordinate to the Naval Composite Warfare Commander (CWC). Additionally, the proposed MIW Concept of Operations only addresses Amphibious Readiness Group (ARG) and Battle Group (BG) MCM asset employment.²¹ As illustrated throughout this paper, this structure limits the ability to coordinate joint amphibious operations. Moreover, although beyond the scope of this paper, mine warfare assets are limited in number and are not expected to increase in the out years. With limited MCM assets and mission requirements outside of the ARG/BG, such as support of combined/joint logistics-over-the-shore (CLOTS/JLOTS) and Q-route sweeping for Military Pre-positioned Force (MPF) shipping, these assets must be considered theater level assets and managed from the theater level. Doctrine must be developed that concentrates on the theater allocation and employment vice the ARG/BG support. Appendix (b) delineates two possible command structures that can allow the Operational Commander to effectively employ theater MCM assets. This doctrinal

shift does not imply that all amphibious operations must be conducted from the JTF or CINC level. If strictly naval forces can conduct the amphibious operation, the JTF commander can delegate the conduct of the amphibious operation to the CWC or CATF. However, initial planning for the operation should be conducted at the JTF level to ensure all available COAs have been considered.

Finally, the VSW/SZ mine threat produces no greater of a planning challenge than any other war fighting discipline. The very nature of warfare dictates that casualties will be sustained in order to achieve victory. Some operations are inherently more dangerous than others and present a greater potential risk to the forces employed. When all available means have been employed to diminish the risk, planners must weigh the casualty estimates against the operational and strategic advantages of conducting the operation and allow the Operational Commander to make the subjective decision of a COA's merit. If "zero acceptable casualties" military operations are the expected result of future operations, then the amphibious assault, by the very nature of the casualties anticipated during the assault phase, has become obviated and the threat of VSW/SZ mines made inconsequential.

11. Recommendations

- Adopt a flexible, joint planning approach, to be conducted at the JTF level, with the MIWC as a theater asset component commander.
- Remove the doctrinal requirement for VSW/SZ minefield clearance as a prerequisite to the amphibious assault, thereby eliminating the clandestine requirement opening numerous force planning and integration options.

- Stop devoting scarce resources towards the development of a magic solution and concentrate on detection and the tenants of OMFTS in a tailored and joint planning process to mitigate the threat of VSW/SZ minefields.
- Realize and accept the fact that casualties will occur in warfare and some operations are inherently higher risk than others. When operational risk management and cost verses benefit realities have been considered, the operational and strategic benefit of conducting an operation may outweigh the cost in casualties.

¹ United States Joint Chiefs of Staff, Joint Doctrine for Barriers, Obstacles and Mine Warfare (Joint Pub 3-15) (Washington, DC: 1993), 66.

² President of the United States, A National Security Strategy for a New Century (Washington, DC: 1998), 26-27.

³ Office of Chairman JCS, National Military Strategy (Washington, DC: 1998), 26.

⁴ United States Joint Chiefs of Staff, Joint Doctrine for Amphibious Operations (Joint Pub 3-02) (Washington, DC: 1992), XV-11; United States Joint Chiefs of Staff, Joint Doctrine for Force Landing Operations (Joint Pub 3-02.1) (Washington, DC: 1989), I-5-I-8; United States Joint Chiefs of Staff, Joint Tactics, Techniques, and Procedures for Sealift Support to Joint Operations (Joint Pub 4-01.2) (Washington, DC: 1996), VI-12.

⁵ Dwight H. Lyons, The Mine Threat: Show Stoppers or Speed Bumps? (Alexandria, VA: Center for Analysis, 1993), 6-19.

⁶ Theodore L. Gatchel, At the Water's Edge (Annapolis, MD: U.S. Naval Institute Press, 1996), 184-185.

⁷ Dwight H. Lyons, The Mine Threat: Show Stoppers or Speed Bumps? (Alexandria, VA: Center for Analysis, 1993), 6-19.

⁸ Arthur A. Adkins, Solving the MCM Problem: A Matter of Focus and Priority (Newport, RI: Naval War College, 1996), 11.

⁹ Matthew M. Aylward, Mines in the Surf Zone: A Proposed Breaching Concept (Monterey, CA: Naval Postgraduate School, 1994), 5-6.

¹⁰ United States Marine Corps, Concepts and Plans Division, Operational Maneuver From The Sea (Quantico, VA: MCCDC, 1993), 2-12.

¹¹ Commander in Chief Atlantic/Pacific Fleet, Fleet Mine Warfare Concept of Operations (MIW CONOPS) (Proposed) (Corpus Christi, TX: Commander Mine Warfare Command, 1999), Appendix A.

¹² Commander in Chief Atlantic/Pacific Fleet, Fleet Mine Warfare Concept of Operations (MIW CONOPS) (Proposed) (Corpus Christi, TX: Commander Mine Warfare Command, 1999), 6-1.

¹³ Matthew M. Aylward, Mines in the Surf Zone: A Proposed Breaching Concept (Monterey, CA: Naval Postgraduate School, 1994), 7-8.

¹⁴ D. H. L. MacDonald, Surf Zone/Very Shallow Water Mining Nemesis or Oxymoron for Amphibians (Newport, RI: U.S. Naval War College, 1998), 15-16.

¹⁵ D. H. L. MacDonald, Surf Zone/Very Shallow Water Mining Nemesis or Oxymoron for Amphibians (Newport, RI: U.S. Naval War College, 1998), 5-6.

¹⁶ United States Joint Chiefs of Staff, Joint Doctrine for Amphibious Operations (Joint Pub 3-02) (Washington, DC: 1992), XV-11.

¹⁷ Matthew M. Aylward, Mines in the Surf Zone: A Proposed Breaching Concept (Monterey, CA: Naval Postgraduate School, 1994), 5-6.

¹⁸ Harry M. Murdock, Doctrine for Combined Airborne and Amphibious Operations (Leavenworth, KS: School of Advanced Military Studies, United States Army Command and General Staff College, 1991), 1-48.

¹⁹ Matthew M. Aylward, Mines in the Surf Zone: A Proposed Breaching Concept (Monterey, CA: Naval Postgraduate School, 1994), 40.

²⁰ Office of Chairman JCS, National Military Strategy (Washington, DC: 1998), 20.

²¹ Commander in Chief Atlantic/Pacific Fleet, Fleet Mine Warfare Concept of Operations (MIW CONOPS) (Proposed) (Corpus Christi, TX: Commander Mine Warfare Command, 1999), 1-1 through 5-3.

BIBLIOGRAPHY

- Adkins, Arthur A. and Burnette David P. Solving the MCM problem: a matter of Focus and Priority. Newport, R.I.: Naval War College, 1996.
- Aylward, Matthew M. Mines in the Surf Zone: A proposed Breaching Concept. Monterey, Ca.: Naval Postgraduate School, 1994.
- Ball, James F. The Effects of Sea Mining Upon Amphibious Warfare. Newport, R.I.: Naval War College, 1992.
- Boutwell, Brian. Some Planning Considerations for Joint Operations in a Maritime Theater. Newport, R.I.: Naval War College, 1989.
- Cashman, T. Michael. Sweeping Changes for Mine Warfare: Controlling the Mine Threat. Monterey, Ca.: Naval Postgraduate School, 1994.
- Cassidy, Charles J. Airborne Laser Mine Detection Systems. Newport R.I.: Naval War College, 1995.
- Commander in Chief Atlantic/Pacific Fleet. Fleet Mine Warfare Concept of Operations (MIW CONOPS) (Proposed). Corpus Christi, TX: Commander Mine Warfare Command, 1999.
- Friedman, Norman. Desert Victory: the War for Kuwait. Annapolis, Md.: U.S. Naval Institute Press, 1996.
- Gatchel, Theodore L. At the Water's Edge. Annapolis, Md.: U.S. Naval Institute Press, 1996.
- King, Colin. The Mine Conundrum: The Threat to Mine-clearance Operations. Coulsdon, England: James Information Group, 1995.
- Lluy, Paul A. Mine Warfare: An Old Threat Presents New Challenges for NATO's Post-cold War Navies. Monterey Ca.: Naval Postgraduate School, 1995.
- Lyons, Dwight H. The Mine Threat: Show Stoppers or Speed Bumps?. Alexandria, Va.: Center for Analysis, 1993.
- MacDonald, D.H.L. Surf Zone/Very Shallow Water Mining Nemesis or Oxymoron for Amphibians. Newport, R.I.: U.S. Naval War College, 1998.
- Melia, Tamara M. Damn the Torpedoes. Washington D.C.: Naval Historical Centre, 1991.

- Murdock, Harry M. Doctrine for Combined Airborne and Amphibious Operations: A Monograph. Fort Leavenworth, Ks.: U.S. Army Command and General Staff College, 1991.
- Office of the Chairman JCS. National Military Strategy. Washington D.C.: CJCS, 1998.
- Oxford, Donald G. Command and Control Considerations for Amphibious Operations in Limited Warfare: A Monograph. Fort Leavenworth, Ks.: U.S. Army Command and General Staff College, 1990.
- Rossi, Gary L. Explosive Ordnance Disposal (EOD) Mine Countermeasures (MCM) Tactics Development Plan. Newport, R.I.: Naval War College, 1994.
- Trumbore, Jeffery A. <eoduxo@ite.net> "Your JMO Paper Topic." 29 November 1999. Personal Email. (29 November 1999).
- Trumbore, Jeffery A. <eoduxo@ite.net> "MIW CONOPS Review." 09 January, 2000. Personal Email. (09 January, 2000).
- U.S. Joint Chiefs of Staff. Joint Doctrine for Amphibious Operations (Joint Pub 3-02) Washington, D.C.: 1992.
- U.S. Joint Chiefs of Staff. Joint Doctrine for Landing Force Operations (Joint Pub 3-02.1) Washington, D.C.: 1989.
- U.S. Joint Chiefs of Staff. Joint Doctrine for Barriers, Obstacles and Mine Warfare (Joint Pub 3-15) Washington, D.C.: 1992.
- U.S. Joint Chiefs of Staff. Joint Tactics Techniques and Procedures for Sealift Support to Joint Operations (Joint Pub 4-01.2) Washington, D.C.: 1996.
- U.S. Marine Corps. Joint Countermine Operations. Quantico, VA: HQ Marine Corps, 1993.
- U.S. Marine Corps. Operational Maneuver from the Sea. Quantico, VA: HQ Marine Corps, 1993.
- U.S. President. A National Security Strategy for a New Century. Washington, D.C.: The White House, 1998.
- Wallace, R. J. Mine Warfare: Its Implications for the Future of Amphibious Operations. Washington, D.C.: The Industrial College of the Armed Forces, 1993.
- Weber, Timothy R. An Analysis of Lemmings: A Swarming Approach to Mine Countermeasures in the VSW/SZ/BZ. Monterey, CA: Naval Postgraduate School, 1995.

Appendix A

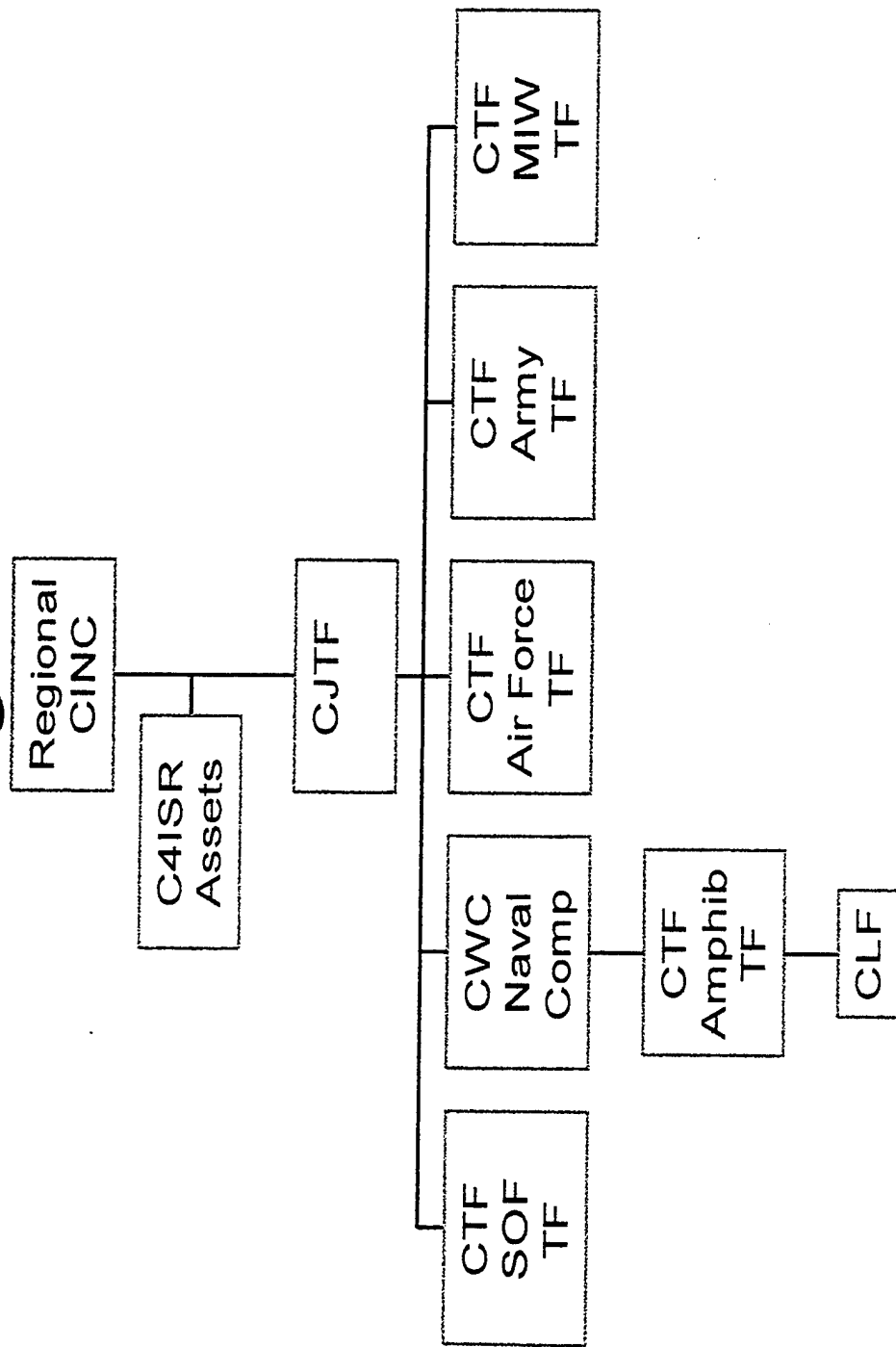
Very Shallow Water and Surf Zone Minefield Disruption Considerations

There are two methods to defeat a minefield. One is to disarm the mine by breaking the explosive train in the mine itself through physical damage, usually using explosive tools, or by component removal (neutralization). The other is to explode the mine thereby removing the threat (clearance). This can be accomplished by causing the mine to function as designed or by counter-charging the main charge and sympathetically detonating the mine. In the case of physically damaging the mine and the later case of exploding the mine, these methods would divulge the location of the landing unless conducted just prior to the assault. Waiting until just prior to the assault would require employment of a disruption technique in the VSW/SZ water column in advance and expecting it to remain in its required location until the appropriate time of actuation. This presents numerous difficulties in coordination, timing, and physical constraints. Additionally it does not allow for verification of the results, forcing the Operational Commander to proceed with the assault under the assumption that the clearance method has been successful.

Coordinating a detonation with an approaching assault wave presents a force protection and timing impediment that has never been successfully accomplished with a reasonable expectation of repeatability. This method requires exact timing to prevent damage to the assault force from the disruption method itself. Additionally, a misfire or deflagration (incomplete detonation) of the disruption method would require the entire assault force to be halted or turned back, compromising the assault location and creating a coordination nightmare. To disrupt mines in the surf zone, placement of a neutralization device (explosive or mechanical) would have to occur at some time prior to the assault and

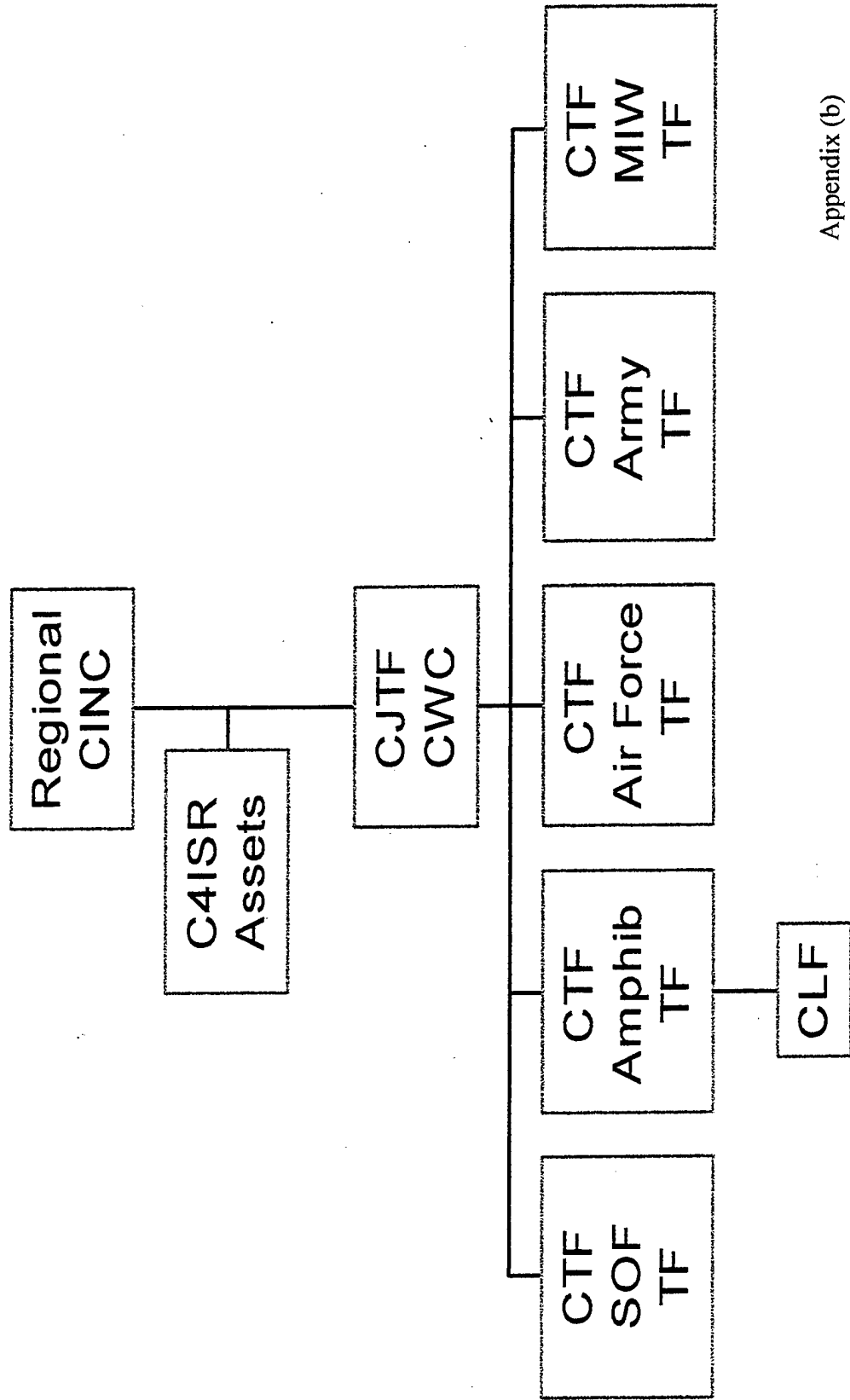
remain in its location until actuation. This presents physical limitations that have yet to be overcome and highly dependent on bottom type, contour, and tidal variations. The only method that would ensure a clandestine neutralization of the field is disarming the mine by component removal, which presents grave danger to the technician and is time preclusive since it would have to be individually conducted on each mine. Barring an unforeseen technological development, these approaches are not viable methods of defeating the threat, if concealment of the landing site is desired, and should be discarded.

JTF Organization



Appendix (b),
Figure (1)

CWC as CJTF



Appendix (b)
Figure (2)